



12AB5

BEAM POWER TUBE

For Use in Automobile Radio Receivers Operating From 12-Volt Storage Batteries
9-Pin Miniature Type
TENTATIVE DATA

RCA-12AB5 is a beam power tube of the 9-pin miniature type designed for use as the output amplifier in automobile radio receivers operating from a 12-volt storage battery.

The 12AB5 can provide high power output because of its high power sensitivity and high efficiency. For example, in class A₁ amplifier service, a single 12AB5 operated with a plate voltage of 250 volts, and a grid-No.2 voltage of 250 volts, can deliver a maximum-signal power output of 4.5 watts with a peak driving voltage of only about 12.5 volts. This performance, together with relatively low plate-current drain, make the 12AB5 especially suitable for use in the output stage of automobile receivers.

Design features of the 12AB5 include a large plate structure to allow for greater heat dissipation, a heater specially processed to withstand these severe operating conditions encountered during battery charging and discharging, and double base-pin connections for grid No.1 and grid No.2 to provide for cooler grid operation and greater flexibility of circuit connection.

GENERAL DATA

Electrical:

Heater for Unipotential Cathode:

Voltage Range 10.0 to 15.9 volts

This voltage range is on an absolute basis. For longest life, it is recommended that the heater be operated within the voltage range of 11 to 14 volts.

Current (Approx.), at 12.6 volts 0.2 amp

Direct Interelectrode Capacitances (Without external shield):

Grid No.1 to plate 0.7 max. $\mu\mu\text{f}$

Grid No.1 to heater, cathode & grid No.3, and grid No.2 8 $\mu\mu\text{f}$

Plate to heater, cathode & grid No.3 and grid No.2 8.5 $\mu\mu\text{f}$

Mechanical:

Mounting Position Any

Maximum Overall Length 2-5/8"

Maximum Seated Length 2-3/8"

Length from Base Seat to Bulb Top (Excluding tip) 2" \pm 3/32"

Maximum Diameter 7/8"

Bulb T-6-1/2

Base Small-Button Noval 9-Pin (JETEC No.E9-1)

SINGLE-TUBE CLASS A₁ AMPLIFIER

Maximum Ratings, Design-Center Values:

For application of these design-center ratings to storage-battery operation, see Operating Considerations.

PLATE VOLTAGE 315 max. volts
GRID-NO.2 (SCREEN) VOLTAGE 285 max. volts

PLATE DISSIPATION 12 max. watts
GRID-NO.2 INPUT 2 max. watts
PEAK HEATER-CATHODE VOLTAGE:
Heater negative with respect to cathode 90 max. volts
Heater positive with respect to cathode 90 max. volts
BULB TEMPERATURE (At hottest point on bulb surface) 250 max. °C

Characteristics with 12.6 volts on heater:

Plate Voltage 250 250 volts
Grid-No.2 Voltage 200 250 volts
Grid-No.1 Voltage - -12.5 volts
Cathode-Bias Resistor 270 - ohms
Peak AF Grid-No.1 Voltage 10.5 12.5 volts
Zero-Signal Plate Current 33.5 45 ma
Max.-Signal Plate Current 36 47 ma
Zero-Signal Grid-No.2 Current (Approx.) 1.6 4.5 ma
Max.-Signal Grid-No.2 Current (Approx.) 3.2 7.0 ma
Plate Resistance (Approx.) 75000 50000 ohms
Transconductance 4000 4100 μmhos
Load Resistance 6000 5000 ohms
Total Harmonic Distortion 8 8 %
Max.-Signal Power Output 3.3 4.5 watts

Maximum Circuit Values:

Grid-No.1-Circuit Resistance:
For fixed-bias operation 0.1 max. megohm
For cathode-bias operation 0.5 max. megohm

PUSH-PULL CLASS AB₁ AMPLIFIER

Values are for two tubes

Maximum Ratings, Design-Center Values:

For application of these design-center ratings to storage-battery operation, see Operating Considerations.

PLATE VOLTAGE 315 max. volts
GRID-NO.2 (SCREEN) VOLTAGE 285 max. volts
PLATE DISSIPATION 12 max. watts
GRID-NO.2 INPUT 2 max. watts

PEAK HEATER-CATHODE VOLTAGE:

Heater negative with respect to cathode 90 max. volts

Heater positive with respect to cathode 90 max. volts

BULB TEMPERATURE (At hottest point on bulb surface) 250 max. °C

Characteristics with 12.6 volts on heater:

Plate Voltage 250 volts
Grid-No.2 Voltage 250 volts
Grid-No.1 Voltage -15 volts
Peak AF Grid-No.1-to-Grid-No.1 Voltage 30 volts
Zero-Signal Plate Current 70 ma
Max.-Signal Plate Current 79 ma
Zero-Signal Grid-No.2 Current (Approx.) 5 ma
Max.-Signal Grid-No.2 Current (Approx.) 13 ma
Plate Resistance (Approx.) 60000 ohms



PUSH-PULL CLASS AB₁ AMPLIFIER (Cont'd)

Characteristics with 12.6 volts on heater:

| | | |
|---|-------|------------|
| Transconductance | 3750 | μ mhos |
| Effective Load Resistance (Plate-to-plate) | 10000 | ohms |
| Total Harmonic Distortion | 5 | % |
| Max.-Signal Power Output | 10 | watts |

Maximum Circuit Values:

| | |
|--------------------------------------|-----------------|
| Grid-No.1-Circuit Resistance: | |
| For fixed-bias operation | 0.1 max. megohm |
| For cathode-bias operation | 0.5 max. megohm |

- Operation of heater in series with other heaters is not recommended.

OPERATING CONSIDERATIONS

The *maximum ratings* in the tabulated data for the 12AB5 are working design-center maximums established according to the standard design-

center system of rating electron tubes. Tubes so rated will give satisfactory performance in storage-battery-operated equipment provided the following stipulations are observed:

In the case of storage-battery-with charger supply or similar supplies, the normal battery-voltage fluctuation may be as much as 35 per cent or more. This fluctuation imposes severe operating conditions on tubes. Under these conditions, the equipment should be designed so that 90% of the design-center maximum values of plate voltage, grid-No.2 voltage, plate dissipation and grid-No.2 input is never exceeded for a battery terminal potential of 13.2 volts. Although the operating voltages of the 12AB5 in this service will, at times, exceed the design-center maximum values, satisfactory performance with probable sacrifice in life will be obtained.

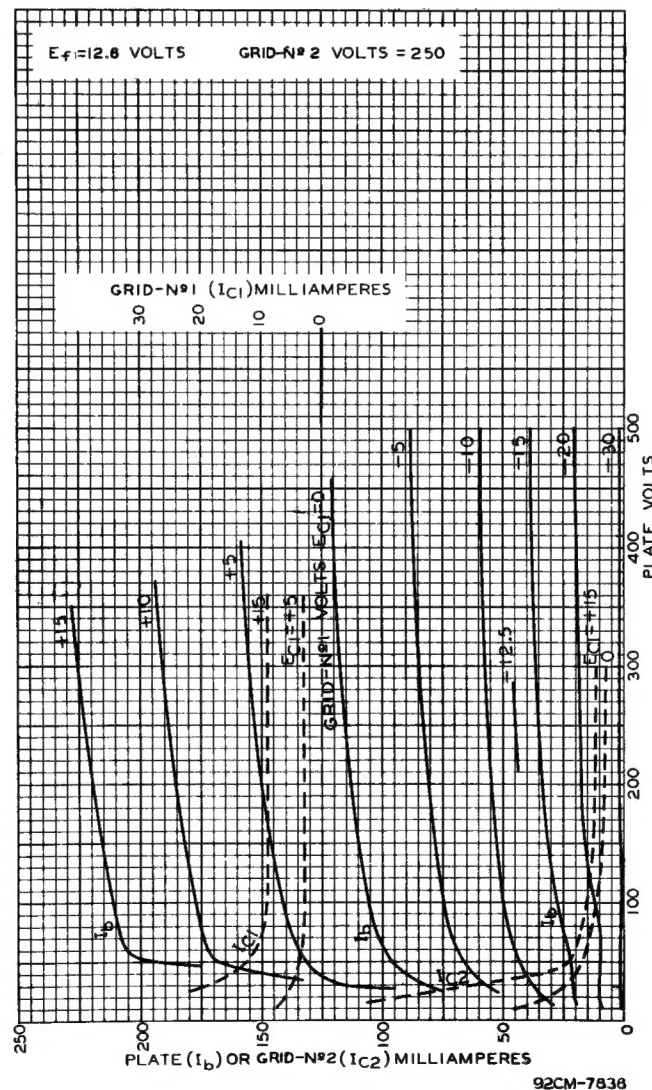


Fig.1 - Average Plate Characteristics of Type 12AB5.

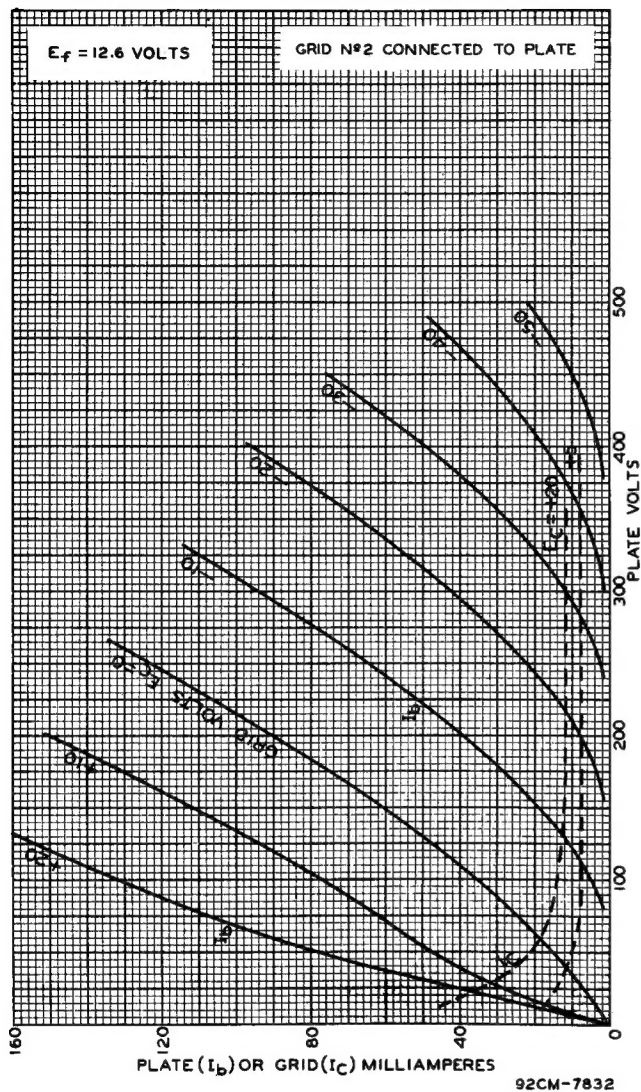


Fig-2 - Average Plate Characteristics of Type 12AB5 Connected as Triode.

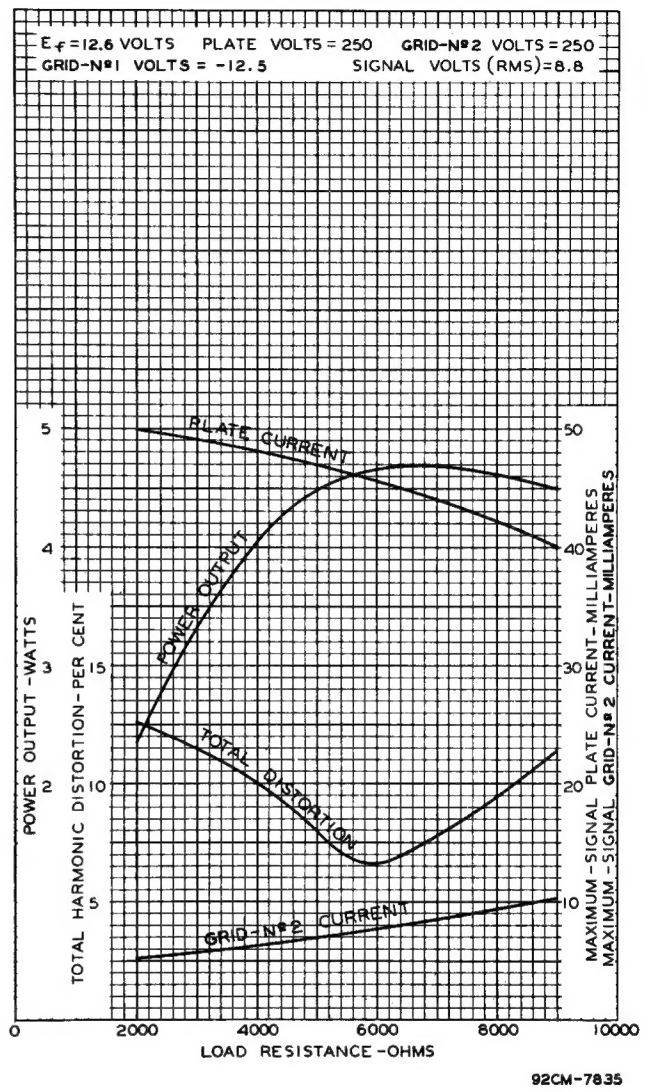
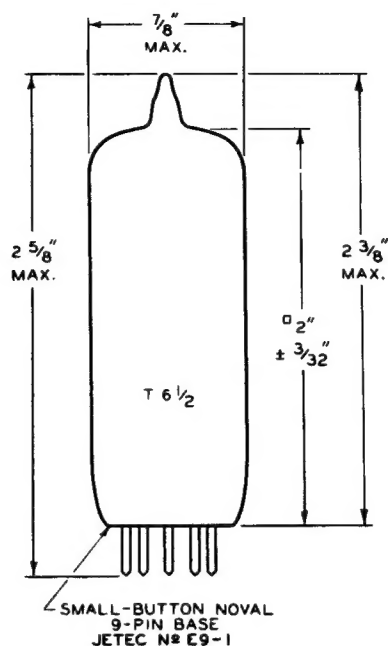


Fig.3 - Operation Characteristics of Type 12AB5.

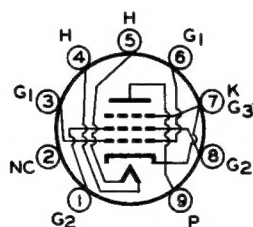


DIMENSIONAL OUTLINE



□ MEASURED FROM BASE SEAT TO BULB-TOP LINE
AS DETERMINED BY RING GAUGE OF 7/16" I.D.

SOCKET CONNECTIONS Bottom View



- PIN 1: GRID No.2
- PIN 2: NO CONNECTION
- PIN 3: GRID No.1
- PIN 4: HEATER
- PIN 5: HEATER
- PIN 6: GRID No.1
- PIN 7: CATHODE, GRID No.3
- PIN 8: GRID No.2
- PIN 9: PLATE

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